



Les Industries Spectralux Inc. Spectralux Industries Inc.

2750 Sabourin, Saint-Laurent (Quebec) H4S 1M2 Canada
Tel.: (514) 332-0082 Fax: (514) 332-3590 www.spectralux.ca

ISO/IEC 17025



NVLAP LAB CODE: 200899-0

Moving Mirror Goniophotometer Test Report

Standard(s): IESNA LM-35-02, IES LM-79-08, ANSI C82.77-2002

Customer Lumenpulse, 1751 Richardson, suite 1505, Montréal, Québec, Canada, H3K 1G6

General Information		SSL Details	Driver Details	
Test Report	S1512142-R1	Description	20W White 4000K SSL	Type Commercial
Test Date	14 December 2015	Serial Number	SRIS 2230	Description 20SSL-CY938
Report Date	17 December 2015	Photometric Method	Absolute	Manufacturer Magtech Industries
Ambient	25.4°C	Lamp Lumens	-1	Catalog No. 20-3871
Humidity	22.9 %	Test Position	Axial	Voltage Tap 120.00 V
Lamp Type	SSL	Comments	Clusters of 24 Cree XPE2 LED's	Power Factor 0.9900

Floodlight Data

General Information		Optics	Aperture (feet)	
Manufacturer	Lumenpulse	Reflector	24 Collimators	X 4.0000
Name	LUMENFACADE	Housing	Extruded Aluminum	Y 0.1667
Catalog No.	LOG-ASHRAE-120-48- 40K-10x60-SI-NO	Lens	Polycarbonate	Z 0.0000

Lamp Stabilization Time: 45 minutes

Tested By: Marc Viwonou Sena

Approved Signatory: Chrisnel Blot

Signature:



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Luminaire Test Method

Precise installation and alignment of the luminaire to the rotation axis of the photometer is governed by a servomotor controlled via a microcontroller. A laser is used to validate the luminaire positioning. Before photometric measurements are taken, luminaire is operated long enough to reach stabilization and temperature equilibrium.

All movement commands issued to the photometer axes are mediated by the software to ensure the motion is within the limits of operation. The photometric detector used is a silicon detector corrected to closely match the spectral luminous efficiency photopic curve with a quality index less than 1.5%. Proper shielding is incorporated to the photometric test bench such that only the light from the unit under test is measured.

Luminous intensity measurements are performed at a distance great enough so that the inverse-square law applies. During each measurement the computer records the luminous intensity associated to the corresponding angles of radiation, as well as input electrical operational parameters and temperature measurements. Candela values are reported in IES format as per LM-63.

Equipment, reference standards are traceable to National Institute of Standards and Technology (NIST) and National Research Council of Canada (NRC).





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Electrical Equipment

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Power Supply	Elgar	CW801	30527	N.P.C.R.	N.P.C.R.
Input Power Meter	Yokogawa	WT210	27E116584	2014/10/30	2016/10/30
Output Power Meter	N/A	N/A	N/A	N.P.C.R.	N.P.C.R.

Photometric Equipment

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Photometer	N/A	N/A	N/A	N.P.C.R.	N.P.C.R.
Photodetector	INPHORA	IPR-PDET 19	110802	2015/10/05	2016/10/05

Environment Equipment

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Temperature Humidity Sensor	Omega	HH311	120504178	2014/04/16	2016/04/16



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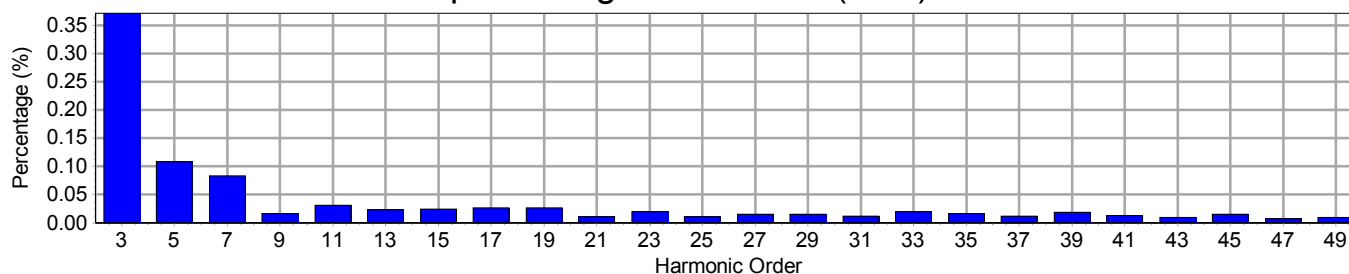
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Electrical Measurements

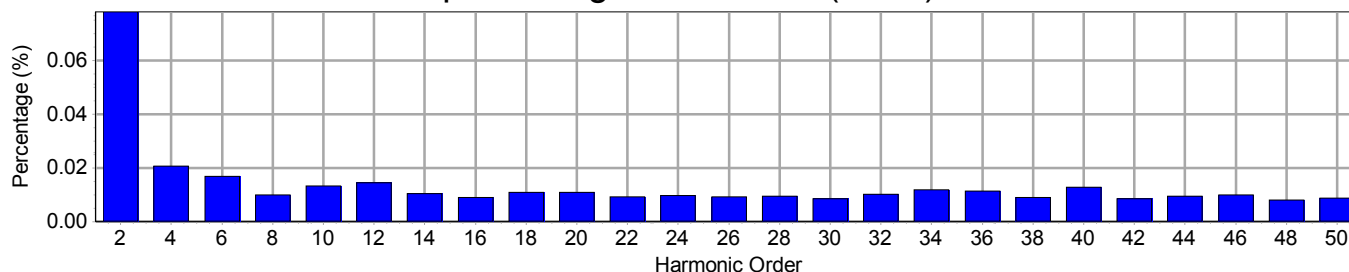
Input

Frequency	60 Hz	Active Power	18.41 W	THDV [ANSI]	0.41 %
Voltage	120.7 V(rms)	Apparent Power	18.54 VA	THDA [ANSI]	8.62 %
Current	0.1536 A(rms)	Power Factor	0.993	Max. Harmonic At	3rd order

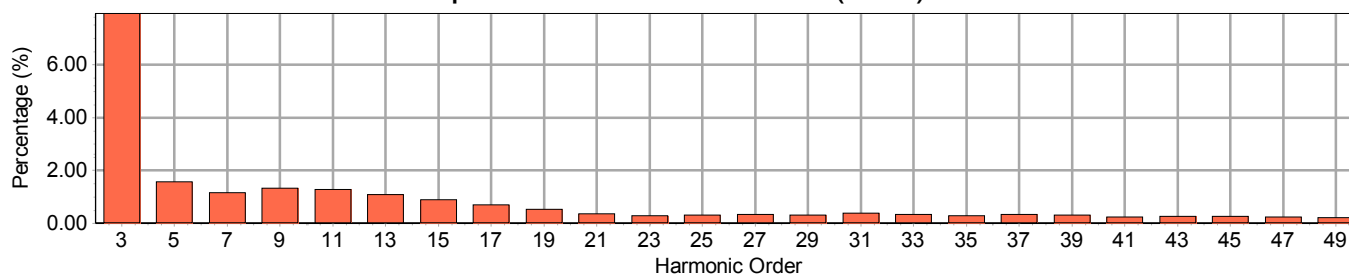
Input Voltage Harmonics (Odd)



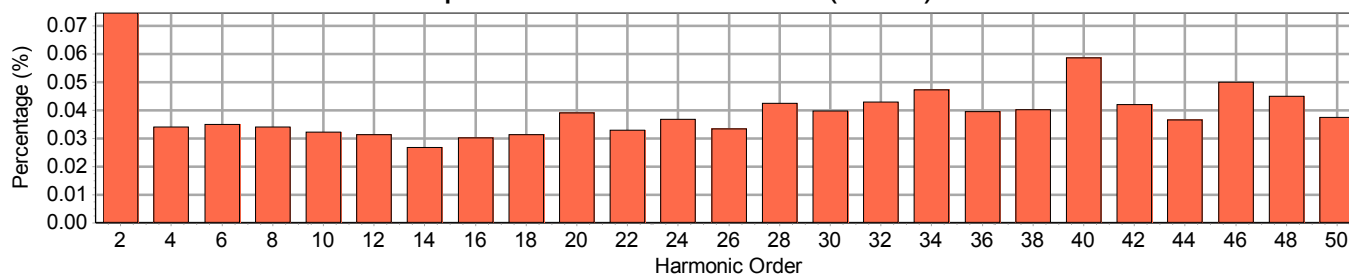
Input Voltage Harmonics (Even)



Input Current Harmonics (Odd)



Input Current Harmonics (Even)





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Harmonic Measurements

Odd Harmonics				Even Harmonics			
Harmonic Order	Frequency (HZ)	Voltage Harmonics (%)	Current Harmonics (%)	Harmonic Order	Frequency (HZ)	Voltage Harmonics (%)	Current Harmonics (%)
1	60	100.000	100.000	2	120	0.078	0.075
3	180	0.372	7.963	4	240	0.021	0.034
5	300	0.108	1.561	6	360	0.017	0.035
7	420	0.083	1.156	8	480	0.010	0.034
9	540	0.017	1.334	10	600	0.013	0.032
11	660	0.032	1.269	12	720	0.014	0.031
13	780	0.023	1.086	14	840	0.010	0.027
15	900	0.025	0.888	16	960	0.009	0.030
17	1020	0.026	0.687	18	1080	0.011	0.031
19	1140	0.027	0.522	20	1200	0.011	0.039
21	1260	0.011	0.364	22	1320	0.009	0.033
23	1380	0.020	0.283	24	1440	0.010	0.037
25	1500	0.011	0.296	26	1560	0.009	0.033
27	1620	0.016	0.324	28	1680	0.009	0.042
29	1740	0.015	0.294	30	1800	0.008	0.040
31	1860	0.012	0.368	32	1920	0.010	0.043
33	1980	0.020	0.330	34	2040	0.012	0.047
35	2100	0.017	0.268	36	2160	0.011	0.039
37	2220	0.012	0.319	38	2280	0.009	0.040
39	2340	0.019	0.295	40	2400	0.013	0.059
41	2460	0.014	0.225	42	2520	0.008	0.042
43	2580	0.010	0.264	44	2640	0.009	0.037
45	2700	0.016	0.253	46	2760	0.010	0.050
47	2820	0.007	0.233	48	2880	0.008	0.045
49	2940	0.010	0.200	50	3000	0.009	0.037



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Photometric Report: S1512142-R1

Prepared for: Lumenpulse · Test Date: 14 December 2015

Floodlight: LUMENFACADE · Lumcat: LOG-ASHRAE-120-48-40K-10x60-SI-NO

Photometric Floodlight Characteristics

Nominal SSL Power	20.00 W	
Measured Input Voltage	120.66 V	Notes
Test SSL Current	0.300 A	1) Floodlight tested in accordance to IES LM-35-1989 at a distance great enough so that the inverse-square law applies.
Floodlight Luminous Flux	1017	
Measured Input Power	18.41 W	
Floodlight Luminous Efficacy	55.2 lm/W	2) Field performance may differ from laboratory measurements.
Maximum Candela Value	4553	
Maximum Candela Location	5.0 H, 0.0 V	3) Results are valid for the tested material only.
Horizontal Beam Angle (50%)	66.0 °	
Vertical Beam Angle (50%)	9.5 °	4) All data published in this report are based on absolute photometry.
Horizontal Field Angle (10%)	94.0 °	
Vertical Field Angle (10%)	22.0 °	5) The original electronic file or paper report cannot be edited in whole or in part without written consent of Spectralux Industries Inc.
IES/NEMA Type Classification	5Hx2V	
Beam Lumens (50%)	498	
Beam Efficiency (50%)	N/A	
Field Lumens (10%)	837	
Field Efficiency (10%)	N/A	
Spill Lumens	180	
Total Floodlight Lumens	1017	
Total Floodlight Efficiency	N/A	



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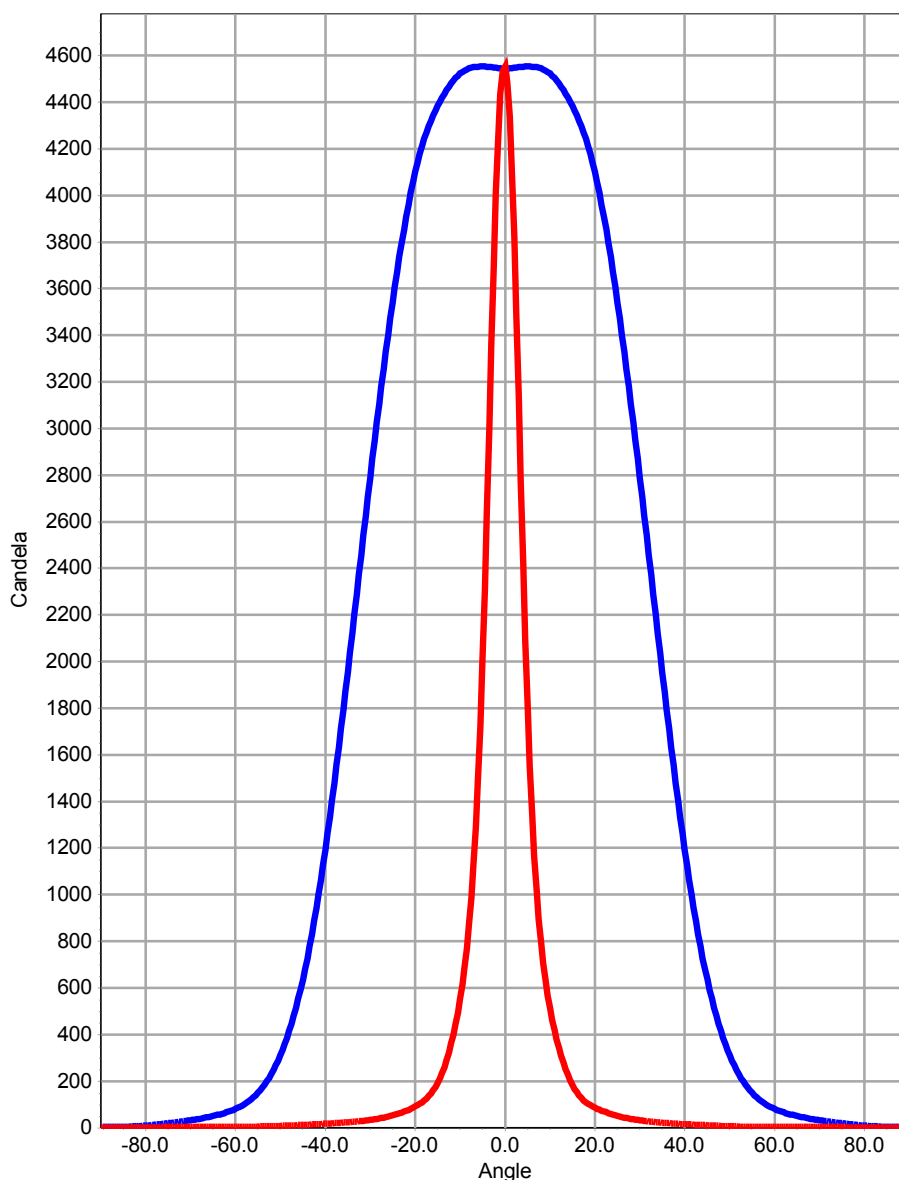
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Floodlight: LUMENFACADE · Lumcat: LOG-ASHRAE-120-48-40K-10x60-SI-NO

Maximum Candela Trace (Max. Location: 5.0 H, 0.0 V)

Horizontal Angles	Candela
-90.0	3
-85.0	5
-80.0	9
-75.0	19
-70.0	32
-65.0	50
-60.0	81
-55.0	150
-50.0	310
-45.0	635
-40.0	1194
-35.0	1954
-30.0	2789
-25.0	3540
-20.0	4102
-15.0	4384
-10.0	4522
-5.0	4553
0.0	4542
5.0	4553
10.0	4522
15.0	4384
20.0	4102
25.0	3540
30.0	2789
35.0	1954
40.0	1194
45.0	635
50.0	310
55.0	150
60.0	81
65.0	50
70.0	32
75.0	19
80.0	9
85.0	5
90.0	3



Vertical Angles	Candela
-90.0	2
-85.0	1
-80.0	2
-75.0	3
-70.0	4
-65.0	4
-60.0	4
-55.0	5
-50.0	8
-45.0	12
-40.0	17
-35.0	24
-30.0	34
-25.0	53
-20.0	91
-15.0	192
-10.0	549
-5.0	1993
0.0	4553
5.0	1804
10.0	513
15.0	184
20.0	86
25.0	51
30.0	32
35.0	22
40.0	15
45.0	11
50.0	7
55.0	4
60.0	4
65.0	4
70.0	4
75.0	3
80.0	2
85.0	1
90.0	3

— Horizontal — Vertical



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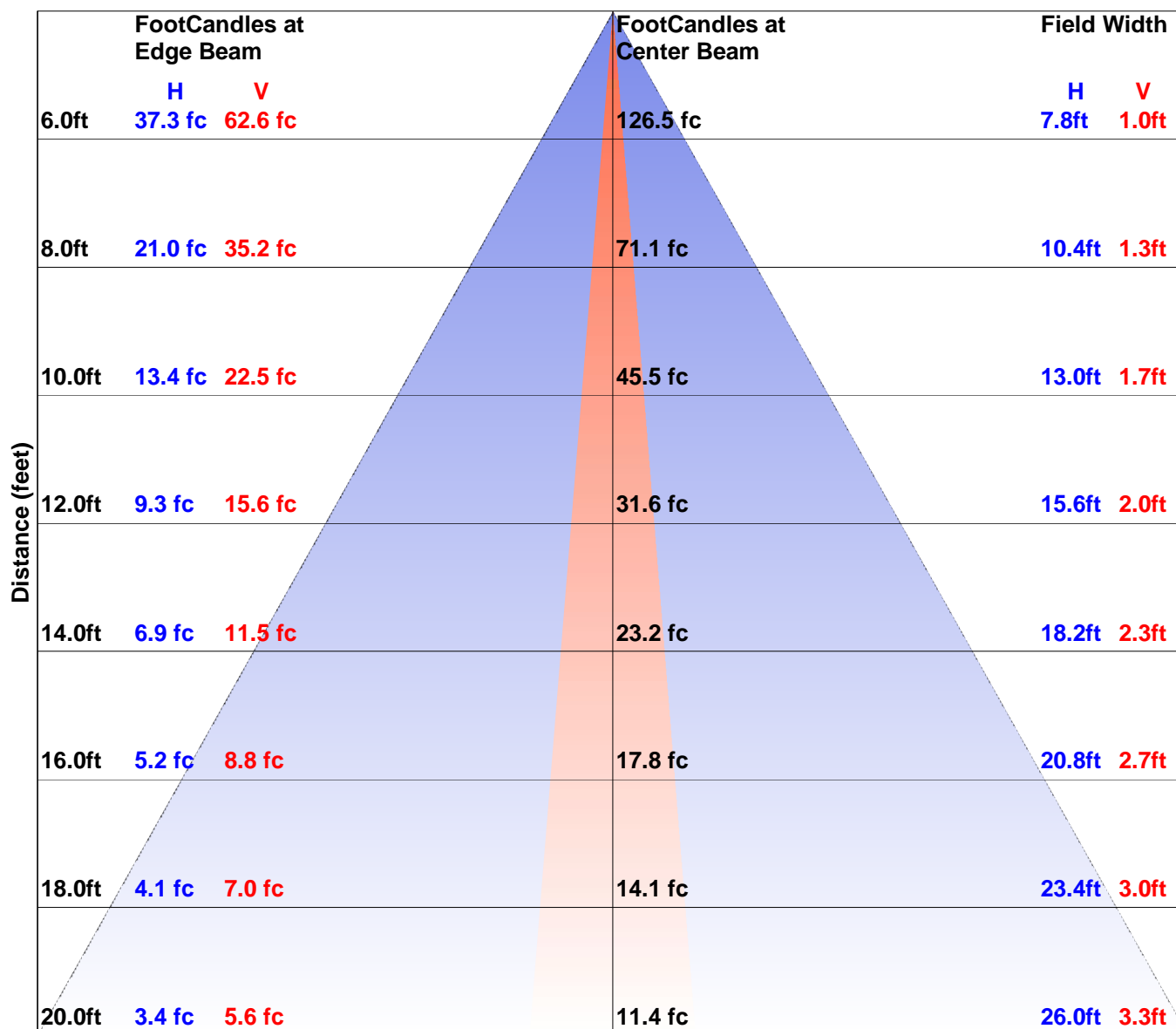
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Prepared for: Lumenpulse · Test Date: 14 December 2015

Floodlight: LUMENFACADE · Lumcat: LOG-ASHRAE-120-48-40K-10x60-SI-NO

Downlight Beam



— Horizontal (66.0 °) — Vertical (9.5 °)



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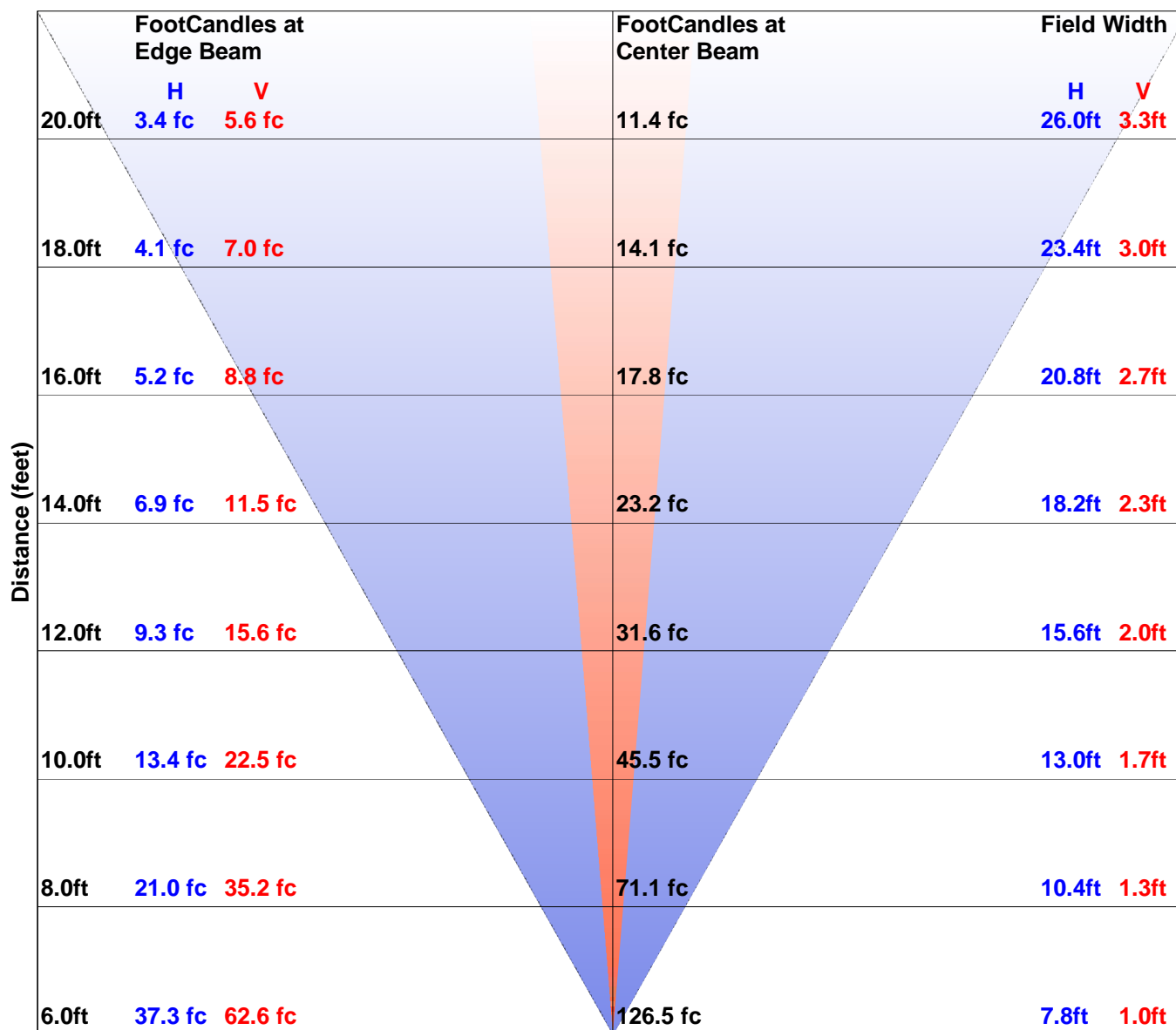
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Prepared for: Lumenpulse · Test Date: 14 December 2015

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Uplight Beam



— Horizontal (66.0 °) — Vertical (9.5 °)



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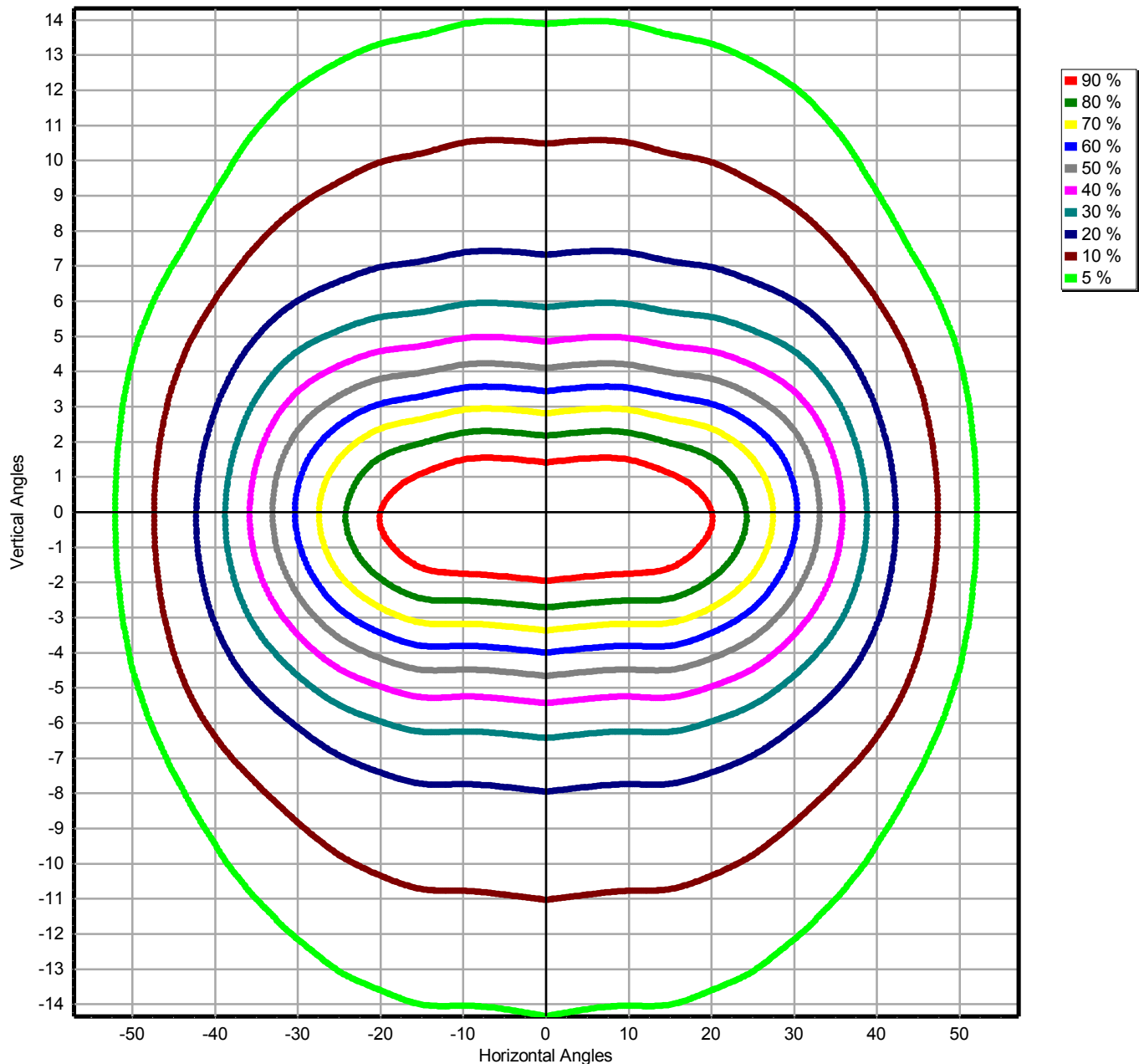
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Floodlight: LUMENFACADE · Lumcat: LOG-ASHRAE-120-48-40K-10x60-SI-NO

ISO Candela Diagram





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IES File Headers

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IESNA:LM-63-2002
[ISSUEDATE]      14 December 2015
[TESTLAB]        Spectra Lux Industries Inc.
[TEST]           S1512142-R1
[MANUFAC]        Lumenpulse
[LUMCAT]          LOG-ASHRAE-120-48-40K-10x60-SI-NO
[LUMINAIRE]       LUMENFACADE
[LAMP]           (Clusters of 24 Cree XPE2 LED's) 20W SSL c/w Driver 20-3871 @ 120.00V
[_BURNING]        Axial (1,017 Luminaire Lumens)
[_REFLECTOR]      24 Collimators
[_LENS]           Polycarbonate
[_HOUSING]        Extruded Aluminum
[DISTRIBUTION]    NEMA 5Hx2V (Max. CP at 5.0H,0.0V)
[MORE]           (Based on IES LM-35-1989)
```

Candela Table

Horizontal Angles

	0.0	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0
V e r t i c a l A n g l e s	-90.0	1	2	2	2	2	3	2	4
	-85.0	2	1	2	3	3	2	2	2
	-75.0	3	3	2	2	2	3	3	3
	-65.0	3	4	3	4	3	5	3	4
	-55.0	5	5	5	7	6	6	4	5
	-45.0	11	12	9	9	10	10	9	8
	-35.0	23	24	21	23	22	21	19	16
	-25.0	55	53	52	53	50	46	43	35
	-20.0	94	91	89	90	86	78	70	54
	-15.0	197	192	186	184	171	153	130	89
	-12.5	334	323	316	312	288	256	211	132
	-12.0	369	361	351	346	320	283	235	144
	-11.5	412	399	390	387	355	314	260	158
	-11.0	458	444	433	430	396	349	287	172
	-10.5	507	493	482	477	440	387	318	187
	-10.0	567	549	537	533	490	431	353	207
	-9.5	632	613	600	595	548	481	391	225
	-9.0	707	686	672	666	613	538	437	249
A n g l e s	-8.5	796	771	755	751	691	605	491	276
	-8.0	898	870	852	850	780	685	552	308
	-7.5	1020	987	967	966	889	779	627	345
	-7.0	1165	1126	1104	1107	1016	891	715	392
	-6.5	1338	1292	1268	1272	1170	1024	821	442
	-6.0	1541	1488	1461	1466	1348	1180	943	501
	-5.5	1785	1722	1691	1700	1559	1360	1085	567
	-5.0	2065	1993	1956	1964	1799	1566	1243	636
	-4.5	2382	2302	2262	2265	2073	1798	1420	711
	-4.0	2728	2641	2596	2595	2373	2050	1611	787
	-3.5	3090	3000	2953	2941	2690	2318	1813	862
	-3.0	3445	3361	3313	3286	3009	2590	2021	938
	-2.5	3781	3703	3654	3615	3316	2852	2223	1009
	-2.0	4071	4007	3962	3901	3589	3088	2407	1071
	-1.5	4305	4256	4213	4132	3813	3284	2566	1126
	-1.0	4466	4435	4397	4294	3974	3428	2687	1167
	-0.5	4548	4536	4501	4392	4088	3519	2762	1189



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Horizontal Angles

	0.0	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	
V e r t i c a l	0.0	4542	4553	4522	4384	4102	3540	2789	1954	1194
	0.5	4457	4484	4459	4298	4011	3478	2760	1933	1178
	1.0	4291	4336	4313	4139	3873	3364	2681	1881	1145
	1.5	4051	4114	4094	3909	3668	3193	2558	1799	1097
	2.0	3753	3827	3809	3621	3406	2972	2396	1691	1035
	2.5	3417	3497	3481	3294	3109	2721	2207	1569	966
	3.0	3050	3137	3122	2942	2785	2447	2002	1435	892
	3.5	2689	2771	2758	2593	2462	2173	1792	1296	815
	4.0	2341	2419	2407	2258	2150	1906	1586	1161	738
	4.5	2023	2093	2082	1951	1863	1659	1393	1031	664
	5.0	1741	1804	1794	1681	1609	1436	1216	905	590
	5.5	1504	1553	1543	1447	1385	1241	1053	793	522
	6.0	1299	1342	1332	1248	1197	1071	914	693	460
	6.5	1128	1164	1154	1084	1036	927	792	602	406
	7.0	988	1017	1007	944	903	807	690	528	357
	7.5	870	893	884	830	792	707	604	464	318
	8.0	772	792	783	735	699	624	534	410	284
	8.5	689	706	696	655	622	555	473	367	257
	9.0	618	631	623	586	556	496	424	330	232
	9.5	556	567	560	527	500	445	382	297	211
A n g l e s	10.0	503	513	505	475	451	401	344	270	193
	10.5	453	463	456	429	407	362	311	246	176
	11.0	412	418	412	388	368	328	282	223	162
	11.5	372	378	372	350	331	297	255	203	149
	12.0	335	342	337	316	299	268	232	186	137
	12.5	303	309	304	285	270	242	210	166	125
	15.0	181	184	180	168	160	145	128	106	84
	20.0	86	86	86	83	80	76	70	60	52
	25.0	51	51	50	49	47	44	42	38	33
	35.0	21	22	21	21	20	20	19	18	15
	45.0	10	11	9	8	9	8	8	8	6
	55.0	6	4	5	4	4	4	4	4	3
	65.0	2	4	3	4	3	3	2	3	2
	75.0	3	3	2	2	4	2	4	3	3
	85.0	3	1	2	2	2	1	2	2	2
	90.0	2	3	3	0	3	1	2	2	3



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Horizontal Angles

		45.0	50.0	55.0	60.0	65.0	70.0	75.0	80.0	85.0
V e r t i c a l	-90.0	3	1	2	2	3	3	4	2	3
	-85.0	3	3	2	3	3	3	3	2	2
	-75.0	3	3	2	4	3	2	3	2	2
	-65.0	4	3	4	3	5	4	2	2	4
	-55.0	4	5	4	2	4	3	3	3	3
	-45.0	8	6	5	6	4	3	3	4	2
	-35.0	15	12	10	8	7	5	4	3	1
	-25.0	30	25	20	17	12	8	6	4	2
	-20.0	45	35	29	23	17	12	8	4	2
	-15.0	69	54	40	30	22	15	10	6	4
	-12.5	97	68	49	37	26	18	12	5	2
	-12.0	104	74	52	38	27	18	13	7	4
	-11.5	112	77	54	39	28	20	14	6	3
	-11.0	122	81	56	41	29	20	12	5	3
	-10.5	130	88	59	42	30	19	14	7	4
	-10.0	141	93	63	43	30	21	14	7	2
	-9.5	153	98	65	46	31	22	13	7	2
	-9.0	167	107	70	48	32	21	14	7	4
	-8.5	183	114	73	50	34	23	15	7	3
	A n g l e s	-8.0	201	124	78	51	35	24	15	6
-7.5		224	136	83	54	38	24	16	8	4
-7.0		249	147	89	57	38	26	17	7	3
-6.5		278	161	96	60	40	27	16	7	3
-6.0		311	177	103	62	42	26	16	8	4
-5.5		346	191	108	66	43	27	18	7	3
-5.0		382	208	116	68	45	29	17	9	4
-4.5		419	226	121	71	45	29	18	8	5
-4.0		456	240	127	73	46	30	19	9	3
-3.5		491	253	132	75	46	31	19	9	3
-3.0		526	269	137	77	49	31	19	8	5
-2.5		557	279	141	79	48	31	19	9	2
-2.0		583	289	144	80	49	31	19	9	4
-1.5		607	299	147	79	49	32	19	9	3
-1.0		625	304	149	81	48	33	19	9	3
-0.5		634	307	150	82	50	32	19	9	3
0.0		635	310	150	81	50	32	19	9	5
0.5		630	307	150	82	49	31	19	9	4
1.0		615	302	149	81	48	32	19	9	3
1.5		593	298	146	80	49	32	19	9	4
2.0	567	287	143	79	48	31	19	8	3	
2.5	536	277	141	79	48	31	18	9	4	
3.0	504	266	136	76	48	31	19	9	5	
3.5	469	252	132	74	47	30	18	9	3	
4.0	431	237	128	73	46	30	17	9	4	
4.5	395	223	122	70	44	30	17	9	4	
5.0	359	207	115	68	43	28	18	9	3	
5.5	322	190	109	65	42	28	17	9	4	
6.0	288	176	101	62	40	28	16	8	4	
6.5	259	160	95	59	38	26	17	9	3	
7.0	231	145	90	57	38	25	15	8	3	
7.5	207	134	82	53	36	25	15	8	4	
8.0	189	122	78	51	35	23	15	8	3	
8.5	172	113	74	49	34	23	14	8	3	
9.0	156	106	68	46	32	22	14	7	3	



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ISO/IEC 17025



NVLAP LAB CODE: 200899-0

Horizontal Angles

	45.0	50.0	55.0	60.0	65.0	70.0	75.0	80.0	85.0	
V e r t i c a l	9.5	146	98	64	45	31	22	15	8	3
	10.0	134	91	62	44	30	20	12	7	3
	10.5	123	87	59	41	29	20	13	7	3
	11.0	115	81	56	40	28	19	13	7	2
	11.5	106	76	53	38	27	19	11	6	3
	12.0	99	72	50	36	25	18	12	7	3
	12.5	92	67	49	35	26	18	12	6	2
	15.0	66	52	38	30	21	14	10	6	3
	20.0	44	36	28	22	16	11	8	5	2
	25.0	30	25	21	16	12	8	4	4	3
	35.0	14	12	9	8	6	5	5	3	2
	45.0	6	7	6	5	5	5	2	4	3
	55.0	4	4	5	4	3	3	2	3	2
	65.0	3	2	2	4	4	4	3	2	2
	75.0	3	2	3	2	3	2	3	3	2
	85.0	1	3	1	3	3	3	2	3	3
	90.0	4	2	3	3	2	3	3	3	2

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Horizontal Angles

	90.0
V e r t i c a l	-90.0 2
	-85.0 3
	-75.0 3
	-65.0 2
	-55.0 2
	-45.0 2
	-35.0 3
	-25.0 3
	-20.0 2
	-15.0 2
	-12.5 2
	-12.0 2
	-11.5 3
	-11.0 2
	-10.5 1
	-10.0 3
	-9.5 2
	-9.0 2
	-8.5 3
	-8.0 2
A n g l e s	-7.5 3
	-7.0 3
	-6.5 2
	-6.0 3
	-5.5 3
	-5.0 2
	-4.5 2
	-4.0 3
	-3.5 1
	-3.0 2
	-2.5 4
	-2.0 1
	-1.5 2
	-1.0 3
	-0.5 2
	0.0 3
	0.5 3
	1.0 2
	1.5 2
	2.0 3
	2.5 2
	3.0 2
	3.5 2
	4.0 1
	4.5 3
	5.0 3
	5.5 2
	6.0 2
	6.5 1
	7.0 2
	7.5 2
	8.0 2
	8.5 1
	9.0 3



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Horizontal Angles

	90.0
	9.5
	10.0
	10.5
	11.0
	11.5
	12.0
	12.5
	15.0
	20.0
	25.0
	35.0
	45.0
	55.0
	65.0
	75.0
	85.0
	90.0
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